CITY OF HAZELTON (PWS 5270007)
SOURCE WATER ASSESSMENT UPDATE FINAL REPORT

April 20, 2004

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the City of Hazelton, Idaho* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The City of Hazelton (PWS #5270007) drinking water system consists of two ground water well sources. The previous Source Water Assessment (SWA) report (May 2002) included information on Wells #1 and #2. This SWA report covers the updates to the system: namely the abandonment of Wells #1 and #2 and the addition of Well #4. Well #3 was re-evaluated given the new system set up.

Well #3 and #4 have a high susceptibility rating to IOC, VOC, SOC, and microbial contamination. These ratings are due to a high rating in hydrologic sensitivity, a moderate rating for system construction, and a low number of potential contaminant sources. Lack of well log information caused the hydrologic sensitivity and system construction scores to be higher for the system.

Two IOCs deserve to be singled out because of the future activities that will be occurring to help lower the levels on a statewide basis. These IOCs, nitrate and arsenic, are identified in every source water assessment report that has such detections and singled out with the specific levels that have been detected.

The IOCs arsenic, barium, chromium, selenium, mercury, and fluoride were detected in water samples at concentrations below their respective maximum contaminant levels (MCLs) as set by the EPA. In November 2001, arsenic was measured in the reservoir at 12 micrograms per liter (µg/L) and 14 µg/L. In October 2001, the EPA lowered the arsenic MCL from 50 µg/L to 10 µg/L. However, public water systems have until 2006 to meet the new requirement. Nitrate levels in the wells have been consistently below 3.0 milligrams per liter (mg/L). The MCL for nitrate is 10 mg/L. However, the delineation crosses a nitrate priority area. The priority areas were established in 1998 and 1999 by the

Ground Water Monitoring Technical Committee based on data collected from a variety of wells throughout the State. A nitrate priority area is an area where greater than 25% of wells/springs show nitrate values above 5 ppm.

The VOC disinfection by-products chloroform and bromoform were detected in November 2000. These VOCs are not considered to be an issue with the source water, but rather associated with the use of the chlorination system of the City of Hazelton. Additionally, in May 2001, the VOC Di(2-Ethylhexyl)-phthalate was detected in the distribution system. However, Di(2-Ethylhexyl)-phthalate was not detected in the repeat sample taken in June 2001. No SOCs or microbial contamination has been detected in the wells.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

The disinfection by-products detected in the wells were bromoform, bromodichloromethane, chlorodibromomethane, and chloroform. Though water cannot be totally free of by-products when disinfection is used, they can be reduced by treatment modifications. In 1983, EPA identified some technologies, treatment techniques and plant modifications that water systems could use to reduce the amount of disinfection by-products produced. Disinfection by-product control strategies can be accessed at http://www.epa.gov/safewater/mdbp/pdf/alter/chapt_2.pdf.

Because the arsenic in the well is greater than the level of the revised MCL, the system may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system. The EPA plans to provide up to $20 million prior to the 2006 deadline for research and development of more cost-effective technologies to help small systems meet the new MCL (www.epa.gov).

For the City of Hazelton, drinking water protection activities should first focus on maintaining the requirements of the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Any spill from the potential contaminant sources listed in Tables 1 and 2 of this report should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Also, disinfection practices should be continued to keep microbial contamination from harming the water. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Most of the designated areas are outside the direct jurisdiction of the City of Hazelton. Partnerships with state and local agencies and industry groups should be established and are critical to success.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

The City of Hazelton has developed a Drinking Water Protection Plan in the fall of 2003 that incorporates a variety of strategies including, public education, best management practices implementation, and evaluation and development regulatory strategies (i.e. zoning, permitting). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE CITY OF HAZELTON, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the EPA to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. SWAs for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The DEQ recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Hazelton has two community ground water wells that serve approximately 687 people through approximately 252 connections (DEQ, 2003). Currently the City of Hazelton drinking water system consists of Wells #3 and #4. Well #3 and Well #4 are located on a donated lot on the corner of 5th Street and Middleton Avenue adjacent to the glass lined steel storage reservoir. (Figure 1).

The IOCs arsenic, barium, chromium, selenium, mercury, and fluoride were detected in water samples at concentrations below their respective maximum contaminant levels (MCLs) as set by the EPA. In November 2001, arsenic was measured in the reservoir at 12 micrograms per liter (µg/L) and 14 µg/L. In October 2001, the EPA lowered the arsenic MCL from 50 µg/L to 10 µg/L. However, public water systems have until 2006 to meet the new requirement. Nitrate levels in the wells have been consistently below 4.0 milligrams per liter (mg/L). The MCL for nitrate is 10 mg/L. However, the delineation crosses a nitrate priority area. The priority areas were established in 1998 and 1999 by the Ground Water Monitoring Technical Committee based on data collected from a variety of wells throughout the State. A nitrate priority area is an area where greater than 25% of wells/springs show nitrate values above 5 ppm.

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Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. Washington Group, International (WGI) was contracted by DEQ to ascertain the capture zone delineations for Wells #1 and #2 using a refined computer model approved by the EPA in determining the time-of-travel (TOT) zones for water associated with the Southwest Eastern Snake River Plain (SW ESRP) aquifer. DEQ conducted the modeling necessary to determine the TOT zones for Wells #3 and #4. The computer model used site-specific data, assimilated by DEQ and WGI from a variety of sources including local area well logs and hydrogeologic reports summarized below.

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are filled primarily with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with sedimentary rocks along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from 100 feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et al., 1999, p. 15).

Regional ground-water flow is to the southwest paralleling the basin (Cosgrove et al., 1999; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 ft/mile and average 12 ft/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Southwest Margin of the ESRP hydrologic province is the regional aquifer's primary discharge area. Interpretation of well logs indicates that a 1- to 23-foot-thick layer of sediment overlies the fractured basalt aquifer in Jerome County, and that an 8- to 410-foot-thick layer of sediment overlies the same aquifer in southern Minidoka and Power Counties. Published geologic maps of the Snake River Plain (Whitehead 1992, Plates 1 and 5) indicate there is 100 to 500 feet of Quaternary to Tertiary Basalt aged compacted to poorly consolidated sediments located in the Hazelton area (north of the Snake River near Burley). The saturated thickness of the regional basalt aquifer for the Southwest Margin is estimated to range from less than 500 feet near the Snake River to 1,500 feet near Minidoka.

A published water table map of the Kimberly to Bliss region of the aquifer (Moreland, 1976, p. 5) indicates that the ground-water flow direction in the Southwest Margin is similar to that depicted at the regional scale (e.g., Garabedian, 1992, Plate 4).

Annual average precipitation for the period 1951 to 1980 is 9.6 inches in both Twin Falls and Burley (Kjelstrom, 1995, p. 3). The estimated recharge from precipitation in the Southwest Margin ranges from less than 0.5 inch to more than 2 in./yr (Garabedian, 1992, p. 20). Kjelstrom (1995, p. 13) reports an annual river loss of 110,000 acre-feet to the aquifer for the 34.8-mile Minidoka-to-Milner reach of the Snake River. River gains of 210,000 acre-feet for the 21.5-mile Milner-to-Kimberly reach, and 880,000 acre-feet for the 20.4-mile Kimberly-to-Buhl reach are reported for the same period.

The delineated source water assessment areas for the City of Hazelton have been combined for Wells #3 and #4 because of the similar location. The delineation can best be described as approximately triangular extending to the east of the wells with southern boundaries north of and parallel to Interstate 84. The delineation ends approximately 13 miles from the wellheads and is about 4 miles wide at the end (Figure 2). The actual data used by WGI and DEQ in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation area were obtained by field surveys conducted by DEQ, the City of Hazelton, and from available databases.

The dominant land use outside the City of Hazelton area is irrigated agriculture. Land use within the immediate area of the wellheads consists of residential property, commercial and light industrial, and agricultural.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted in late summer 2003 through spring 2004. This involved identifying and documenting potential contaminant sources within the City of Hazelton source water assessment areas through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ in 1998 and 1999. The second, or enhanced, phase of the contaminant inventory is included to allow local operators to update the information to a current state. For the City of Hazelton, operator Roy Crumrine verified DEQs information and provided local knowledge to the process.

Since Well #3 and #4 have the same delineation, they share the same number of potential contaminant sources (Table 1, Figure 2). DEQ identified an underground storage tank (UST) and a dairy in the 3-year TOT and a dairy and a gravel pit in the 10-year TOT as potential point sources. In addition, the delineation has Highway 25 and the North Side Main Canal in the 3-year TOT. The enhanced inventory identified additional irrigation laterals, a bulk fertilizer facility, an open gas station, a car wash, a dump, and two cattle farms. If an accidental spill occurred in any of these sources where they cross the delineation, IOCs, VOCs, SOCs, or microbial contaminants could be added to the aquifer system.

Table 1. City of Hazelton Wells #3 and #4, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST-Open	0-3	Database Search	VOC, SOC
2	Dairy ≤ 200 cows	0-3	Database Search	IOC, Microbial
3	Fertilizer – Bulk and liquid	0-3	Enhanced Inventory	IOC, VOC, SOC
4	Gas station-open, 3 USTs	0-3	Enhanced Inventory	VOC, SOC
5	Car wash (historic-closed)	0-3	Enhanced Inventory	none
	Highway 25	0-3	GIS Map	IOC, VOC, SOC, Microbial
	North Side Main Canal	0-3	GIS Map	IOC, VOC, SOC, Microbial
	Idaho Power (powerline)	0-6	GIS Map/Enhanced	IOC, VOC, SOC
	Milner-Gooding Canal	3-6	GIS Map/Enhanced	IOC, VOC, SOC, Microbial
6	Beat Dump	3-6	Enhanced Inventory	IOC, VOC, SOC
7	Dairy ≤ 200 cows	6-10	Database Search	IOC, Microbial
8	Gravel pit	6-10	Database Search	IOC, VOC, SOC
9	Organic Cattle ≤ 2500 cows	6-10	Enhanced Inventory	IOC, VOC, SOC, Microbial
10	CAFO ≤ 5000 calf	6-10	Enhanced Inventory	IOC, VOC, SOC, Microbial
	Eastern Pacific Railroad	0-10	GIS Map	IOC, VOC, SOC, Microbial
	Irrigation laterals	0-10	GIS Map/Enhanced	IOC, VOC, SOC, Microbial

[1] UST = underground storage tank, CAFO = confined animal feeding operation
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was high for the wells (see Table 2). Regional soils data classifies the delineated area as encompassing predominantly moderate to well-drained soil. Available well logs showed that the vadose zone is composed of fractured basalt. The well logs also show that there are insufficient low permeability zones between the land surface and the water table. The depth to the first water, at the time of drilling, was between 265 and 270 feet below ground surface (bgs) for Well #3 in 1979 and between 311 and 325 feet bgs for Well #4 in 2001.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The City of Hazelton drinking water system consists of two wells that extract ground water for community uses. Both wells rate moderate susceptibility for system construction. The 2003 sanitary survey found that the wellheads and surface seals were maintained and protected from surface flooding.

Completed in 1979, Well #3 was drilled to a depth of 340 feet bgs. Steel casing was installed using a 0.375-inch thick, 16-inch diameter casing set to a depth of 45 feet bgs into "reddish gray lava and basalt" followed by a 0.330-inch thick, 12-inch diameter casing set to a depth of 325 feet bgs into "gray basalt." The well is screened from 280 feet to 320 feet bgs. The original static water level in 1979 was at 280 feet bgs. The cement grout annular seal was set to 22 feet bgs into "gray lava." Well #3 has a pump capacity of 550 gallons per minute (gpm) and a yield of 525 gpm. The well is designed to produce 800,000 gallons per day (gpd) with a maximum daily production of 750,000 gpd. A 12-hour specific capacity test was completed on the well.

Completed in 2001, Well #4 was drilled to a depth of 368 feet bgs. Steel casing was installed using a 0.375-inch thick, 14-inch diameter casing set to a depth of 367 feet bgs into "cinders." The well is screened from 307 feet to 362 feet bgs. The original static water level in 2001 was at 295 feet bgs. A bentonite annular seal was set to 60 feet bgs into "gray basalt." Well #4 has a pump capacity of 525 gpm and a yield of 500 gpm. The well is designed to produce 750,000 gpd with a maximum daily production of 700,000 gpd. No well test information was listed on the well log.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Twelve-inch or greater diameter wells require a casing thickness of at least 0.375-inches. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5

times the design pumping rate. Casing is required to be sealed to a minimum of 18 feet bgs if there is a low permeability layer at that depth. Otherwise, surface seals must be extended into low permeability or consolidated zones. The wells received an additional point in the system construction category because not all the well construction requirements were completed based on the information available. If additional information can be provided for Well #4 (i.e. pump test results), then the system construction score may be lowered provided an improvement to the susceptibility score.

Potential Contaminant Source and Land Use

Wells #3 and #4 rated high for IOCs (e.g., arsenic, nitrate), VOCs (e.g., petroleum products), SOCs (e.g., pesticides), and microbial contaminants (e.g., bacteria) (Table 2). The transportation corridors and agricultural land uses add the most points to the land use scores. County level nitrogen fertilizer use, county level herbicide use, and total county level agricultural chemical use are rated as high for both wells. The delineations also cross a nitrate priority area.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, the storage or application of any potential contaminants within 50 feet of the wellhead will lead to an automatic high score. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking.

Table 2. Summary of the City of Hazelton Susceptibility Evaluation

Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #3	H	H	H	H	H	M	H	H	H	H
Well #4	H	H	H	H	H	M	H	H	H	H

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, both wells rate high in all categories. High hydrologic sensitivity coupled with the fractured basalt geology of the area and much agricultural land use contributed to the high scores. If additional information could be provided (e.g. pump test data, permeability testing on dry versus wet basalt, etc) that would allow for a more accurate assessment of susceptibility, then the scores could be adjusted accordingly.

The IOCs arsenic, barium, chromium, selenium, mercury, and fluoride were detected in water samples at concentrations below their respective MCLs as set by the EPA. In November 2002, arsenic was measured in Well #3 at 6μg/L. In October 2001, the EPA lowered the arsenic MCL from 50 μg/L to 10 μg/L. However, public water systems have until 2006 to meet the new requirement. Nitrate levels in the wells have been consistently below 3.0 mg/L. The MCL for nitrate is 10 mg/L. However, the delineation crosses a nitrate priority area. The priority areas were established in 1998 and 1999 by the Ground Water Monitoring Technical Committee based on data collected from a variety of wells throughout the State. A nitrate priority area is an area where greater than 25% of wells/springs show nitrate values above 5 ppm.

The VOC disinfection by-products chloroform and bromoform were detected in November 2000. These VOCs are not considered to be an issue with the source water, but rather associated with the use of the chlorination system of the City of Hazelton. Additionally, in May 2001, the VOC Di(2-Ethylhexyl)-phthalate was detected in the distribution system. However, Di(2-Ethylhexyl)-phthalate was not detected in the repeat sample taken in June 2001. No SOCs or microbial contamination has been detected in the wells.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For the City of Hazelton, drinking water protection activities should first focus on maintaining the requirements of the sanitary survey. Any spill from the potential contaminant sources listed in Table 1 of this report should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Also, disinfection practices should be continued to keep microbial contamination from harming the water. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Most of the designated areas are outside the direct jurisdiction of the City of Hazelton. Partnerships with state and local agencies and industry groups should be established and are critical to success.

The disinfection by-products detected in the wells were bromoform and chloroform. Though water cannot be totally free of by-products when disinfection is used, they can be reduced by treatment modifications. In 1983, EPA identified some technologies, treatment techniques and plant modifications that water systems could use to reduce the amount of disinfection by-products produced. Other factors that affect the formation of by-products are pH, temperature, and dose of disinfection. Other disinfection by-product control strategies can be accessed at http://www.epa.gov/safewater/mdbp/pdf/alter/chapt_2.pdf.

Because the arsenic in the well is greater than the level of the revised MCL, the system may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system. The EPA plans to provide up to $20 million prior to 2006 for research and development of more cost-effective technologies to help small systems meet the new MCL (www.epa.gov).

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The City of Hazelton has developed a Drinking Water Protection Plan in the fall of 2003 that incorporates a variety of strategies including, public education, best management practices implementation, and evaluation and development regulatory strategies (i.e. zoning, permitting). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

If the City of Hazelton plans to expand further, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use. New PWS wells are required to follow the *Well Construction Standards Rules* (1993) and DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during well construction.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, (mlharper@idahoruralwater.com) Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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Attachment A

City of Hazelton
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : HAZELTON CITY OF   Well# : WELL #3

Public Water System Number 5270007   12/10/2003 9:25:17 AM

		IOC Score	VOC Score	SOC Score	Microbial Score
1. System Construction		SCORE			
Drill Date	11/1979				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2003			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	7	8	8	5
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	8	4	4	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		18	16	16	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	25 to 50% Irrigated Agricultural Land	1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		4	4	4	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0
Cumulative Potential Contaminant / Land Use Score		29	25	27	14
4. Final Susceptibility Source Score		16	15	15	15
5. Final Well Ranking		High	High	High	High

Ground Water Susceptibility Report   Public Water System Name : HAZELTON CITY OF   Well# : WELL #4

Public Water System Number 5270007   12/10/2003 9:25:17 AM

1. System Construction		SCORE			
Drill Date	05/01/01				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2003			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	YES	0			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	5			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	7	8	8	5
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	8	4	4	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
	Total Potential Contaminant Source / Land Use Score - Zone 1B	18	16	16	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	25 to 50% Irrigated Agricultural Land	1	1	1	
	Potential Contaminant Source / Land Use Score - Zone II	4	4	4	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
	Total Potential Contaminant Source / Land Use Score - Zone III	3	3	3	0
Cumulative Potential Contaminant / Land Use Score		29	25	25	14
4. Final Susceptibility Source Score		16	15	15	15
5. Final Well Ranking		High	High	High	High